

**AMENDMENTS TO THE DRAWINGS**

The attached eight (8) sheets of drawings include amendments to Figures 1-15. These sheets replace the original sheets.

Attachment: Replacement sheets (8 pages)

## **REMARKS**

Claims pending in the instant application are numbered 1-27. Claims 1-27 are rejected.

The Applicant respectfully requests reconsideration of the present application in view of the amendments and the following remarks.

### *Objections to the Drawings*

The drawings are objected to under 37 CFR § 1.83(a). The Examiner states that the various tapering regions and the tapering rates must be shown or the features cancelled from the claims. Also, the drawings are objected to because the reference numbers need to be professionally incorporated into the drawings.

The Applicant respectfully submits that Figure 5 as originally filed shows the taper regions and the taper rates as recited in the claims. Page 11, lines 1-5, of the Applicant's specification as originally filed, teaches that the first and second taper regions of the buried tapered waveguide correspond to the regions shown by lengths L1 and L2, respectively, as shown in Figure 5. Page 11, lines 17-20, of the specification as originally filed, teaches that the first and second taper regions of the tapered rib waveguide correspond to the regions shown by L1 and L2, respectively as shown in Figure 5. Thus, the taper regions are shown in Figure 5.

In regards to the taper rates, page 11, lines 7-13 and 17-21, of the specification teaches the taper rates of the taper regions in conjunction with Figure 5. Thus, the taper rates are shown in Figure 5.

In regards to the objection to the reference numbers, the enclosed amended drawing sheets include reference numbers professionally incorporated into the drawings. Thus, the Applicant respectfully requests the objections to the drawings be withdrawn.

*Objections to the Claims*

Claim 22 is objected to because of informalities; specifically, the descriptor “optical” is missing a noun.

Claim 22 has been amended to include the term “beam.” Thus, the Applicant respectfully requests that the claim objections be withdrawn.

*35 U.S.C. § 112 Rejections*

Claims 6, 7, 10, 11, 16-19, 26 and 27 are rejected under 35 U.S.C. § 112, first paragraph, as failing comply with the written description requirement. Specifically, the Examiner states that the Applicant failed to clearly describe the various tapering rates. The Examiner suggests that the Applicant clearly explain the various tapering rates to clearly distinguish the dimension of tapering.

To satisfy the written description requirement, a patent specification must describe the claimed invention in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention (M.P.E.P § 2163 citing *Vas-Cath, Inc. v. Manhurkar*, 935 F.2d 1555, 1563 (Fed. Cir. 1991)).

Claims 6, 7, 10, 11, 16-19, 26 and 27 have been amended to recite a “lateral taper region” and a “lateral taper rate” (emphasis added) to expressly recite the direction of the

taper rate in the taper region. As discussed above, Figure 5 shows the taper regions and the taper rates. Also, in the “Brief Description of the Drawings” section of the specification, Figure 5 is described as a “top view” diagram. One skilled in the art having the benefit of the Applicant’s disclosure would appreciate that the tapering is made in a lateral direction. Thus, the Applicant respectfully requests that the instant § 112 rejections be withdrawn.

*35 U.S.C. § 102 Rejections*

Claims 1-13 and 14-21 are rejected under 35 U.S.C. § 102(b) as being anticipated by Joen., U.S. 6,174,748.

Claim 1 as presently amended expressly recites:

“a buried tapered waveguide disposed in a semiconductor layer …wherein a vertical height of the buried tapered waveguide at the larger end and at a smaller end opposite the larger end are substantially similar.”

Joen is directed to forming a tapered section in a semiconductor device. Joen discloses a vertically tapered section 14A of waveguide 25 (Figure 2; col. 7, lines 19-23). Indeed, an object of Joen is to fabricate a vertical taper (col. 2, lines 60-64). Thus, Joen fails to disclose “wherein a vertical height of the buried tapered waveguide at the larger end and at a smaller end opposite the larger end are substantially similar” as expressly claimed by the Applicant.

Thus, Joen fails to disclose at least one of the expressly recited limitations of claim 1. Accordingly, claim 1 is not anticipated by the cited reference. Independent claims 8 and 14 distinguish for at least the same reasons as claim 1. Claims 2-7, 9-13, and 15-21 are dependent claims and distinguish for at least the same reasons as their independent base claims in addition to adding further limitations of their own. Therefore, the Applicant respectfully requests that the instant § 102 rejections be withdrawn.

*35 U.S.C. § 103 Rejections*

Claims 22-27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Joen in view of Soljacic, U.S. 2003/0031443A1.

As described above, Joen fails to disclose “wherein a vertical height of the buried tapered waveguide at the larger end and at a smaller end opposite the larger end are substantially similar” as expressly claimed by the Applicant.

Soljacic is directed to fiber waveguides. Soljacic discloses a tapered fiber waveguide 910 (Figure 21; para [0227]) that is vertically tapered. Thus, Soljacic fails to disclose “a buried tapered waveguide disposed in a semiconductor layer ... wherein a vertical height of the buried tapered waveguide at the larger end and at a smaller end opposite the larger end are substantially similar” as expressly claimed by the Applicant.

Thus, Joen and Soljacic, whether taken singularly or in combination, fail to disclose, teach, or fairly suggest at least one of the expressly recited limitations of claim 22. Accordingly, claim 22 is not rendered obvious by the cited references. Claims 23-27 are dependent claims and distinguish for at least the same reasons as independent claim 22 in addition to adding further limitations of their own. Therefore, the Applicant respectfully requests that the instant § 103 rejections be withdrawn.

### *Conclusion*

The Applicant submits that in view of the remarks and amendments set forth herein, all pending claims are in condition for allowance. Therefore, the Applicant respectfully requests the Examiner to issue a Notice of Allowance in this case.

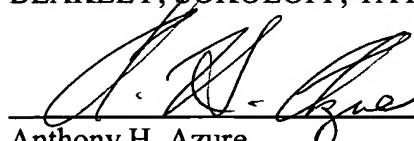
### *Charge Deposit Account*

Please charge our Deposit Account No. 02-2666 for any additional fee(s) that may be due in this matter, and please credit the same deposit account for any overpayment.

Respectfully submitted,

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